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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/805,324

03/22/2004

Hiroki Kitamura

00862.023507.

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01/14/2009

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EXAMINER

STOREY, WILLIAM C

ART UNIT

PAPER NUMBER

2625

MAIL DATE

DELIVERY MODE

01/14/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/805,324	<b>Applicant(s)</b> KITAMURA ET AL.	
	<b>Examiner</b> WILLIAM C. STOREY	<b>Art Unit</b> 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the control and calculation of read addresses in accordance with a number of concurrently drivable printing elements in the distributed driving and the number of the plurality of printing elements in reading out the printing data stored in said buffer memory must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Art Unit: 2625

Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 4, and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takemura et al. (US 6341843), hereinafter referred to as Takemura, in view of Kato et al. (US 6009845), hereinafter referred to as Kato.

Regarding claim 1, Takemura discloses A printing apparatus which performs printing by scanning a carriage that supports a printhead having a plurality of printing elements arrayed in a predetermined direction (figure 4, column 13, line 22), on a printing medium in a direction perpendicular to the predetermined direction (column 9, lines 44-45), comprising: a buffer memory which has a storage area corresponding to each printing element and stores printing data stored in said printing data memory (column 16, 55-57); a head parameter unit which stores information on a number of concurrently drivable printing elements according to distributed driving for the printhead and a number of the plurality of printing elements (column 37, lines 60-61, column 38, lines 40-47, 63-67, column 41, lines 7-13. Takemura discloses printing at different

Art Unit: 2625

resolutions, and correspondingly the nozzles printing with a different driving sequence. (Col. 77, lines 42-45 discloses that the resolution may automatically be determined based on the head configuration of print heads). For example, Takemura discloses driving every 2 nozzles in sequence, which may read on wherein the printhead performs distributed driving for a predetermined number of nozzles, as disclosed at column 56, lines 59-61. Takemura discloses arranging the nozzles at a slant to preserve power; and sequentially driving the nozzles, rather than simultaneously to produce a vertical line (col. 13, lines 25-31). Though Takemura provides this benefit over the known set up of not using an slight slant, and allowing for firing the nozzles at once (concurrently) for the production of a vertical line, it would have been at least obvious to one of ordinary skill in the art at the time the invention was made to provide the non-slanted, vertical set-up at least for the purpose of providing a speed improvement. If nozzle displacement due to the slant would not have to be waited for in sequentially printing a line, but rather, the line could be printed all at once, this would provide an increase in speed. Thus, the number of elements according to distributed driving for the printhead would be concurrently drivable. In addition, col. 48, lines 59-67 and col. 49, lines 1-10, lines 45-50, lines 60-65, col. 53, lines 27-48 show more parameters containing information on a number of concurrently drivable printing elements (nozzles.) Tables are pre-stored that pertain to driving of the nozzles. In addition, data can be modified, and it would have at least been obvious to one of ordinary skill in the art to save that modified data if necessary in order to be able to perform printing quicker for the similar scenario without have to wait for extra processing and calculation. Similarly, buffer

Art Unit: 2625

control tables are sent and registered in the printer (col. 56, lines 13-16) and it would have similarly been at least obvious to store that information for further use that would be fulfilled quicker. As the printing system stores parameters and/or information for the printhead, inherently there is a head parameter unit. The information stored pertains to both a number of concurrently drivable printing elements and a number of the plurality of printing elements, as claimed. (Both are part of the same group of overall nozzles. The information stored pertains to the nozzles. The number of concurrently drivable printing elements and the number of the plurality of printing elements may or may not be one and the same. Information on "both" would be provided for. Other interpretations may be additionally provided for.) Takemura discusses how buffer readout is dependent on numerous factors. One factor is print resolution. Nozzle firing sequence is based on the resolution. It was discussed previously how the printhead nozzles would be aligned to be able to fire all at once to create a vertical line. Further, col. 56, lines 58-61 disclose that it is necessary to fire every other nozzle at low resolution when creating a vertical line. Col. 55, lines 25-28 disclose how the buffer readout is affected by the physical arrangement of nozzles on the print head, actual nozzles used for printing (which are concurrently drivable, for example), print resolution, and the like. These must be known quantities to accordingly affect the readout. When different print heads with different numbers of nozzles are used, the system is shown to adjust the buffer read out accordingly (fig. 43d, col. 54, lines 23-31 pertains to a 136 nozzle printhead; fig. 43f, col. 55, lines 60-62 pertains to a print head comprised of 128 nozzles). As the buffer and/or buffer read out setup has been shown to correspond with

Art Unit: 2625

the number of nozzles (at least buffer height, buffer offset, etc.), inherently a number of the plurality of printing elements must be known. Further, it has previously been discussed how information on the nozzle alignment, etc. may be determined for the print head. Additionally, it would have been at least obvious to one of ordinary skill in the art at the time the invention was made to provide storing information pertaining to the print head, such as a number of the plurality of printing elements (nozzles, for example) and/or a number of concurrently drivable printing elements according to distributed driving for the purpose of providing greater intelligence and/or awareness for the system.); and a buffer controller which controls, in accordance with the information stored in said head parameter unit, processing of reading out the printing data stored in said printing data memory and storing the printing data in said buffer memory, and processing of reading out the printing data stored in said buffer memory (column 53, lines 35-38, column 16, lines 55-57, 62-64, column 54, lines 18-19, 57-58, column 55, lines 5-9. Takemura discloses that print head configuration determines buffer read out and placement. Since Takemura also disclosed read out and placement from the print data store to the buffer based on the storage locations dictated in the print buffer, and that the head configuration dictated gaps in the buffer, then this would read on claimed in accordance with the information stored in said head parameter unit, processing of reading out the printing data stored in said printing data memory and storing the printing data in said buffer memory. Takemura discloses that the buffer readout sequence is change in correspondence with the change in nozzle firing sequence; as disclosed at column 82, lines 15-18, column 83, lines 25-34 and figure 47. It was previously

Art Unit: 2625

discussed how the buffer readout is adjusted based on the nozzles that are actually used for printing and/or the resolution. It was previously discussed how for low resolution, only every other nozzle is used. Additionally, it was disclosed how the buffer readout differs based on the number of nozzles. Thus, the buffer controller acts in accordance with the information stored in said head parameter unit, as claimed.); and driving control means for controlling the distributed driving of the plurality of printing elements in the printhead according to the information stored in said head parameter unit (it was disclosed earlier how information about print head driving is stored (thus inherently storing information about driving the plurality of printing elements in the printhead). Fig. 43a, col. 49, lines 51-65 disclose an example of how the information stored about driving the elements is used to provide control for the driving control means. In addition, as it was discussed previously how the modifications to the pre-stored information could be stored and the information for distributed driving and the plurality of printing elements could thus be stored and used for control. Inherently, as this information is used to print and drive the print head and nozzles, there is a driving control means.); wherein said buffer controller calculates a read address in accordance with the number of concurrently drivable printing elements in the distributed driving and the number of the plurality of printing elements in reading out the printing data stored in said buffer memory (It has been discussed previously how the buffer read out is altered depending on the number of concurrently drivable printing elements in the distributed driving and the number of the plurality of printing elements. When reading out the data



Art Unit: 2625

from the printing buffer, the calculated read addresses based on the buffer readout are used.).

Takemura did not specifically disclose a printing data memory which stores printing data of a raster format. However, Takemura did disclose a printing data memory (print data store (col. 16, lines 34-36) and discusses a “raster skip” command for skipping a number of raster lines (col. 28, lines 9-12). The examiner maintains that it was well known in the art to provide a printing data memory which stores printing data of a raster format, as taught by Kato.

In a similar field of endeavor, Kato discloses a serial printer, and image buffer access method for serial printer. In addition, Kato discloses a printing data memory which stores printing data of a raster format (column 8, lines 10-13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takemura by specifically providing a printing data memory which stores printing data of a raster format, as taught by Kato, for the purpose of providing the data in the print data store in a well known format. This would allow for greater ease.

Regarding claim 2, the claim inherits everything as applied above for claim 1. . In addition, the previous discussions allowed for wherein the information stored in said head parameter unit includes at least the number of nozzle arrays of the printhead, the number of nozzles which constitute the nozzle arrays, and nozzles to be driven in the nozzle arrays. Takemura discloses the printer having pre-loaded information for many different types of print heads (column 48, lines 65-66). In addition, Takemura discloses

Art Unit: 2625

above reading a print head ID in order to determine characteristics about the print head. Takemura also discloses being able to receive new parameters such as driving information and buffer read out parameters (column 49, lines 46-50). In order to set up the print buffer to compensate for the elements of nozzle arrays as disclosed in this embodiment, it is inherent that the number of nozzle arrays, number of nozzles on those arrays, and the actual nozzles used for printing (which reads on claimed nozzles to be driven in the nozzle arrays) be a known value (disclosed above and column 55, lines 25-32). The previous discussions disclosed having such buffer setup information and parameters pertaining to the nozzles of the printhead being stored in the head parameter unit.

Regarding claim 3, Takemura and Kato disclose everything as applied above for claim 1. Takemura did not specifically disclose the buffer controller converting the raster data into column data in reading out the printing data stored in said buffer memory. However, the examiner maintains that it was well known in the art to provide the buffer controller converting the raster data into column data in reading out the printing data stored in said buffer memory, as taught by Kato.

In a similar field of endeavor, Kato discloses dealing with printing data for printing. In addition, Kato discloses the buffer controller converting the raster data into column data in reading out the printing data stored in said buffer memory (figure 3, column 8, lines 26-35).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takemura by specifically providing the buffer

Art Unit: 2625

controller converting the raster data into column data in reading out the printing data stored in said buffer memory, as taught by Kato, for the purpose of providing aligning the data in a more vertical arrangement to match the alignment of nozzles in a near-vertical arrangement, reducing the load on the CPU during the transfer process, increasing speed during the transfer process, and/or improving the throughput.

Regarding claim 4, the previous disclosures disclose everything as applied above for claim 1. Takemura discloses the buffer read out specifying the buffer control sequences or tables from which data is read out from print buffer during print operation by the printer (col. 53, lines 58-60 and col. 54, lines 9-10). Further, it is disclosed that the addressed print data from the print buffer is transferred for printing from the print heads (col. 17, lines 31-36). Therefore, it would have been at least obvious to one of ordinary skill in the art at the time the invention was made to read out the data from each address corresponding to the data in the buffer based on the read out scheme for the purpose of providing greater control.

Further, the examiner maintains that it was well known in the art to provide reading out the printing data stored in said buffer from each address, as taught by Kato.

In a similar field of endeavor, Kato discloses an image buffer access method for serial printer. In addition, Kato discloses the buffer controller reading out the printing data stored in said buffer from each address (column 8, lines 28-35, column 9, lines 13-16).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takemura by specifically providing reading out

Art Unit: 2625

the printing data stored in said buffer from each address, as taught by Kato, for the purpose of providing matched access to print data.

Regarding claim 6, Takemura and Kato disclose everything as applied above for claim 4. However, Takemura fails to disclose wherein said buffer controller includes a register which holds, by a plurality of addresses, data of predetermined bits read out by accessing each address of said buffer memory. However, the examiner maintains that it was well known in the art to provide wherein said buffer controller includes a register which holds, by a plurality of addresses, data of predetermined bits read out by accessing each address of said buffer memory, as taught by Kato.

In addition, Kato discloses at the print timing, a set of data comprising of a plurality of bytes, which comprises bits, for C, M, Y, and K color nozzles, which are used for sequential addresses, are read from the image buffer, and at the same time, are transferred to the head data register, which reads on claimed wherein said buffer controller includes a register which holds, by a plurality of addresses, data of predetermined bits read out by accessing each address of said buffer memory, as disclosed at column 13, lines 1-8. It is inherent that some buffer control much be exerted in order to control the buffer to do anything, thereby reading on claimed buffer controller.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takemura by specifically providing wherein said buffer controller includes a register which holds, by a plurality of addresses, data of

Art Unit: 2625

predetermined bits read out by accessing each address of said buffer memory, as taught by Kato, for the purpose of synchronously transmitting data at specific timing.

Regarding claim 7, the claim inherits everything as applied above for claim 1. Takemura discloses the buffer read out specifying the buffer control sequences or tables from which data is read out from print buffer during print operation by the printer (col. 53, lines 58-60 and col. 54, lines 9-10). Further, it is disclosed that the addressed print data from the print buffer is transferred for printing from the print heads (col. 17, lines 31-36). As print data is transferred from the buffer memory to the printhead, inherently, there must be a transfer means for doing so. Further, the examiner maintains that it was well known in the art to provide a transfer means for transferring the data read out from said buffer memory to the printhead, as taught by Kato.

In a similar field of endeavor, Kato discloses a printer and image buffer access method. In addition, Kato discloses a printing data memory which stores printing data of a raster format and the buffer memory storing raster data of predetermined bits in correspondence with the respective printing elements (column 8, lines 10-13, column 7, lines 44-49); and transfer means for transferring the data read out from said buffer memory to the printhead (column 9, lines 20-23).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takemura by specifically providing a transfer means for transferring the data read out from said buffer memory to the printhead, as taught by Kato, for the purpose of providing the data in the print data store and buffer in

a well known format and transferring data to the printhead from the buffer memory, thus providing compatibility and greater efficiency.

Regarding claim 8, changing an apparatus to a method does not make a claim patentably distinct. The claim is rejected based upon similar reasoning as applied above for claim 1.

### ***Response to Arguments***

5. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendments.

6. Applicant's arguments filed 10/10/08 have been fully considered but they are not persuasive.

7. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., cannot accept various types of printheads) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further, applicant claims that Takemura teaches a printhead printing with a fixed number of concurrently drivable printing elements, but not according to distributed driving. However, it has been discussed that Takemura discloses driving every 2 nozzles for lower resolution, which read on distributed driving for a predetermined number of nozzles. Thus, there are a number of concurrently drivable printing elements according to distributed driving. This was previously sated in the prior office action. As

Art Unit: 2625

applicant has provided no rationale against the discussions of the prior office action in order to support the statement made in the remarks, the prior rejection will stand.

Regarding the applicant's proposal that Takemura does not provide for storing information on both a number of concurrently drivable printing elements according to distributed driving for a printhead and a number of a plurality of printing elements in a head parameter unit or calculating a read address in accordance with the number of concurrently drivable printing elements according to distributed driving for a printhead and the number of a plurality of printing elements in reading out print data stored in a buffer memory: In the discussion regarding these limitations, it was discussed how buffer read out is set up based on knowledge of the number of nozzles and the number of concurrently drivable printing elements. The language chosen by the applicant regarding these numbers of elements may be interpreted in many different ways. For example, a number of the plurality of printing elements may be the same number of elements that are concurrently drivable. Further, all of the plurality of printing elements would most likely be concurrently drivable when printing with every nozzle. The distributed driving would be performed for every, or every 1, nozzle, in that case. It was discussed how the numbers that affect the printing and buffer readout must be known values to do so, and that it would have been at least obvious to store that information in order to work with the information in the system as discussed. A box for a name may be drawn around anything, if necessary; where the information is stored may be referred to as a head parameter unit as the information refers to a print head.

Takemura sets up the buffer and the buffer readout based upon the information

Art Unit: 2625

pertaining to the nozzles of the print head, as discussed. The discussions for the claims talked about how it would have been at least obvious for the read out to be set up to refer to addresses of the data in the buffer. Thus, the read addresses for read out correspond with the number of nozzles and the nozzles that are used (or that are being concurrently driven) and/or nozzles based on the resolution. Takemura discloses the buffer read out specifying the buffer control sequences or tables from which data is read out from print buffer during print operation by the printer (col. 53, lines 58-60 and col. 54, lines 9-10). Further, it is disclosed that the addressed print data from the print buffer is transferred for printing from the print heads (col. 17, lines 31-36). In order for the appropriate data to get read out, the read addresses must be calculated to have the appropriate data be read and accessed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WILLIAM C. STOREY whose telephone number is (571)270-3576. The examiner can normally be reached on Monday - Friday Eastern Standard Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on (571) 272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Art Unit: 2625

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William C Storey/  
Examiner, Art Unit 2625

William C Storey  
Examiner  
Art Unit 2625

/W. C. S./  
Examiner, Art Unit 2625  
/King Y. Poon/  
Supervisory Patent Examiner, Art Unit 2625